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Dr Jonathan McNulty
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Dear Jonathan

The academic radiography workforce: Age profile, succession planning and academic development.

Karen Knapp PhD, Chris Wright PhD, Harold Clarke MSc, Sue McAnulla PgC and Julie Nightingale PhD.

Please find attached the above manuscript for consideration for publication in Radiography. This is an original article and has not been published elsewhere. The following contributions were made: Dr Karen Knapp: study chief investigator, data collection, analysis, drafting of paper; Dr Chris Wright: ethics lead, drafting of questions, drafting of paper, Harold Clarke, drafting and piloting of questions, drafting of paper; Sue McAnulla, data analysis, drafting of paper; Dr Julie Nightingale drafting and piloting questions, drafting paper .

The authors worked as a research team throughout the study.

If you require any further information, please do not hesitate to contact me.

Yours sincerely



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The academic radiography workforce: Age profile, succession planning and academic development.

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Abstract

Introduction: Academia is one area of practice in which radiographers can specialise; they compile approximately 2% of the total radiography profession in the UK, but are highly influential and essential for the education and development of the workforce in addition to undertaking research. However, the academic environment is very different to clinical practice and a period of transition is required.

Methods: The aim of this survey was to explore the age and retirement profile of the academic radiography workforce in the UK; to understand the research time allocated to this workforce; the time required to develop a clinical radiographer into an academic and the mentorship and succession planning provisions nationally.

An online UK wide survey was conducted and sent to all 24 Universities delivering radiography education within the UK.

Results: Eighteen out of 24 Universities in the UK responded to the survey. Approximately 30% of radiography academics are due to retire over the next ten years, with over 25% of radiographers who currently hold a doctorate qualification included within this figure. Those entering academia have significantly lower qualifications as a group than those who are due to retire. Developing clinical radiographers into academics was thought to take 1-3 years on average, or longer if they are required to undertake research.

Conclusion: There is vulnerability in the academic radiography workforce. Higher Education Institutions need to invest in developing the academic workforce to maintain research and educational expertise, which is underpinned by master's and doctorate level qualifications.

- Approximately 30% of radiography academics are due to retire over the next ten years.
- Over 25% of radiographers who currently hold a doctorate qualification included due to retire within 10 years.
- Those entering academia have significantly lower qualifications as a group than those who are due to retire.
- There is vulnerability in the academic radiography workforce.
- Higher Education Institutions need to invest in developing the academic workforce to maintain research and educational expertise

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Key words: Academic; Research; Education; Retirement; Development

Introduction

Academia is one area of practice in which radiographers can specialise as they progress through their career. However, the academic environment is very different to clinical practice; the transition from clinical practitioner to academic may take between one to three years. This transition period is certainly extended if academic radiographers are to lead research and supervise PhD students as part of their role. Radiography is considered to be a young academic profession¹ and as such the route in for many radiographers is via a background in clinical practice; in more traditional academic disciplines, the completion of a PhD and one or more post-doctoral positions is the norm. Post-doctoral positions often include teaching and other educational activities and consolidate research skills, thus creating a rounded academic prior to their first lecturer post. However, this model does not address the high level of clinical expertise required by healthcare educators. Many radiographers entering academia from clinical practice have limited experience in teaching, research and scholarship, thus the development needs of radiographers transferring into academia remain high. With only 24 Higher Education Institutions (HEIs) within the UK delivering radiography education, the academic radiography workforce constitutes just a small percentage of the wider profession and as such it is vulnerable to internal and external influences.

Indeed the UK higher education environment in healthcare is in a state of unprecedented change. The Comprehensive Spending Review is changing the way radiography students in England are funded from the 2017-18 intake, alongside removal of the imposed caps on commissioned numbers, resulting in a potential increase in the numbers entering healthcare courses^{2, 3}. However, in the academic environment, there is concern that some elements of the student population may be deterred from entering radiography and a survey of first and second year radiography students in 2016 indicated that up to 60% of those returning surveys would not have entered radiography education under the new funding

1 arrangements, with mature students being most likely to be deterred⁴. Furthermore, in 2016
2 the Stern Review: Research Excellence Framework (REF) has suggested that all research
3 active staff should be submitted in the REF⁵. This means that in future, potentially all
4 radiography academics classified as undertaking research as part of their role will need to be
5 undertaking research of at least national importance and Universities will be graded on this
6 in the next REF. This is potentially beneficial to radiography, since a strong research
7 culture and the development of radiographers to doctoral level to lead research is essential
8 to the profession⁶. However, with the primary route for radiographers entering academia
9 being through clinical practice alongside relatively low numbers of radiographers in the UK
10 holding doctorate level qualifications and with a low level of research activity in the UK, this
11 is likely to be challenging for the profession^{7, 8}. Alternatively, Universities could choose to
12 support fewer radiography academics to undertake research, the increasing use of teaching
13 only contracts may have a potential negative effect on the profession and subsequently the
14 evidence base which underpins practice. Furthermore, in such a situation, radiography as a
15 discipline might become unattractive to those higher education institutions, which are
16 underpinned by the ethos of research to drive excellence. Only a small number of
17 Universities submitted radiographers for assessment in the 2014 REF and it was stated that
18 “research must be seen as a priority for some academic staff and not an add-on”⁹.
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42 Approximately 0.1% of radiographers hold doctorates with very few under the age of 40
43 years which leaves the research workforce aging and vulnerable⁷. Furthermore, the new
44 Society and College of Radiographers (SCoR) research strategy (2016-2021) has ambitious
45 targets to increase the number of radiographers with or studying for a doctorate to 300 by
46 2021¹⁰. Such a rapid expansion needs significant input from HEIs; having sufficient
47 academics with doctorates, research expertise and supervision experience is integral to
48 delivering this target. However, it is uncertain if there is sufficient capacity currently within
49 the UK radiography academic workforce and whether this workforce is ageing, potentially
50 leaving education and research at risk. In Europe only 14.6% of radiography University
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1 departments offer doctoral study¹¹ and while equivalent data is not available for the UK
2 alone, it is probable that not all 24 HEIs delivering radiography education offer doctoral
3 studies.
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8 The purpose of this study was to explore the age and retirement profile of the academic
9 radiography workforce in the UK; to understand the research time allocated to this
10 workforce; the time required to develop a clinical radiographer into an academic and the
11 mentorship and succession planning provisions nationally.
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18 **Methods**

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24 A national survey of managers of UK radiography academic departments was considered to
25 be the most appropriate method to collate the information required for this study. A small
26 working party from the Heads of Radiography Education group outlined the questions
27 required for the survey and these included staff age and retirement profile, the research time
28 allocation of radiography academics, the mentorship requirements of new staff, the sector
29 from which new staff have been recruited and perceptions of timeframes for transition from
30 clinical practice into radiography academics. The study was approved by the research ethics
31 committee (REC) at London Southbank University (Ref: HSCSEP/16/3) and reciprocal
32 approval obtained from the University of Exeter Medical School's REC.
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46 The questions were inputted into SurveyMonkey™ and piloted by two members of the
47 working party, with amendments made to ensure the questions were explicit. The survey
48 was released via the Heads of Radiography Education mailing list, two reminders were sent
49 at 3 and 6 weeks and the survey closed 2 weeks after the final reminder.
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58 Results were downloaded from SurveyMonkey™ (SurveyMonkey, CA) into Microsoft Excel
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2013 (Microsoft Corporation, WA) and analysed to yield descriptive statistics using STATA V14.1 (StataCorp, TX).

Results

Eighteen out of a possible 24 HEIs delivering diagnostic and therapeutic radiography pre-registration education responded to the survey, representing a response rate of 75%. This survey is therefore considered to have a response rate sufficient that the results are generally robust and broadly transferable.

Academic workforce

Table 1 outlines the full-time equivalent and headcount of academic diagnostic radiographers (DR), therapeutic radiographers (RT), other academics (other) and University-funded clinical tutors or practice educators (CT) involved in the delivery of pre-registration and post-registration radiography education in the UK.

Extrapolation based on the mean numbers of staff suggests that there is an estimated diagnostic radiographer academic workforce of 235 and a therapeutic radiographer academic workforce of 112. There are a small number of clinical tutors and other academics also contributing to the delivery of radiography education, but these have not been estimated for the total academic workforce since their use is restricted to a very small number of HEI's.

The current radiography workforce is reported to be 14,051¹² for diagnostic radiographers and 2,423 for therapeutic radiographers¹³. The academic workforce therefore equates to approximately 1.67% and 4.62% for diagnostic and therapeutic radiographers respectively. These figures should be treated with caution as they are based on assumptions scaling the survey data from the responders and therefore may contain errors as a result.

Teaching only contracts

Three Universities have between 75-100% of their radiography academics on 'teaching only' contracts. Two of these HEIs had all (100%) of their part-time diagnostic radiography academics on such contracts, with one University having 50% of their part-time non-radiographers and 100% of their clinical tutors / practice educators on these contracts.

Academic radiography workforce age profile

Figure 1 demonstrate the age profile of diagnostic and therapeutic radiography academics spread across the age ranges.

Expected retirement profile

Table two demonstrates the expected retirement profile of radiography academics and other staff who contribute to radiography education within HEIs. While there are in excess of 30% of radiography academics due to retire in the next 10 years, this profile should provide sufficient time for succession planning. However, an unbalanced distribution across individual HEIs might create challenges for some institutions.

The highest qualifications of the radiographers due to retire over the next 10 years are outlined in table three. This indicates that, in general, the retiring staff are highly qualified and of particular note, the profession will be losing 24 individuals with doctorate level qualifications. If others are not developed to a doctorate level, the pool of potential PhD supervisors with radiography expertise will be reduced in the future. The research time allocation of the academic radiographers due to retire in the next 10 years was recorded, with a median of 10% and a range of <10% to 80%.

Research time

Research time was categorised as the full-time equivalent (FTE) across the workforce within each HEI for diagnostic, therapeutic, non-radiographers and clinical tutors / practice educators. The total research allowance was divided by the total FTE for each category to provide, on average, the research time per FTE for the respondents. There is a wide range of average research time from zero to 29%, zero to 25%, zero to 83% and zero to 1% of workload allocation for diagnostic radiographers, therapeutic radiographers, non-radiography academics and clinical tutors respectively. However, it is acknowledged that within the results it is highly probable that some academics within any given HEI have far greater research time allowances than others.

Recent Academic recruitment activity

Respondents were asked about the experiences they have had recruiting to academic positions in radiography education over the previous two years. The number of posts advertised over the previous two years across the 18 responding HEIs was 40 for diagnostic radiography academics, 9 for therapeutic radiography academics and two for other academics to contribute to radiography programmes. However in the last two years 21% of the responding HEIs had experienced recruitment freezes for radiography academics and 21% reported current frozen posts. When summed together, current and previous freezes on recruitment demonstrated HEIs had been prevented from recruiting to 37% of vacant posts in over the last two years.

Table four outlines the areas from which academic radiographers have been drawn to fill vacancies. The majority of radiographers being appointed to academic positions come from clinical practice, with a small amount of movement between HEIs, both nationally and internationally. Over the last two years there were between one and ten (median four) appropriately qualified candidates for each post. The numbers outlined in table four are

greater than the number of academic posts indicated in the survey, suggesting that some part-time appointments may have been made.

Table five outlines the highest academic qualifications of radiographers appointed to academic posts over the previous two years. The modal qualification is a Master's degree, for both diagnostic and therapeutic radiographers, but there was a significant number of appointments made of radiographers with lower qualifications. Only seven of the 65 radiographers appointed in the last two years had a PhD at the time of their appointment.

Academic development

Teaching-related administration such as module leadership is a key part of delivering radiography education and requires experience in education to undertake. Recruits entering academia from clinical practice generally take on module leadership in the second year of academia, with only 35% being asked to lead a module within their first academic year compared to 88% of candidates who are coming from another HEI. This is intuitive and appropriate, but can create a mentorship and supervision burden for the existing workforce. Indeed all HEIs responding to the survey provide new academics with a mentor to support their development.

The majority of HEIs had no plans to replace radiography academics with other academics teaching on radiography programmes, with only one institution indicating plans to recruit an other academic.

The survey requested opinions on the transition period from clinical radiographer to academic, with 53% indicating 1-2 years, 41% 2-3 years and 6% 3-4 years. Given this long lead in time to develop a clinical radiographer into an academic, 50% of the respondents indicated that there is succession planning for lecturer roles, while 77% indicated there are succession plans only for the higher level leadership roles within radiography education.

Discussion

This is the first survey published which outlines the current age and expected retirement profile of the academic radiography workforce in the UK, in order to explore the potential risks to education. The results of this survey demonstrate a broad age profile of radiography academics across both diagnostic and therapeutic paths of the profession, indicating that there will be a significant loss of academics who hold doctorates and MSc's, with those entering academia having significantly lower qualifications than those exiting⁷. The survey was not designed to report the risk at any individual HEI, but the responses suggest that combined, HEIs are likely to experience up to 30% losses of experienced academics due to retirement over the next ten years. The age profile of radiography academics is older than that of clinical radiographers,¹⁴ but when compared to the University and Colleges Union Survey of health academics, the radiography academics are on average younger than the general health academic population¹⁵.

However, of greater concern and reflecting findings of a previous survey⁷, it appears that there will be a significant loss of academics who hold doctorates and Master's degrees, with those entering academia having significantly lower qualifications than those exiting. This means the research competence of the academic workforce is vulnerable unless there is a commitment from HEIs to develop new staff, in particular to a doctoral level, which is a costly and time consuming commitment. However, to align with the SCoR research strategy, sufficient academics who can supervise radiographers undertaking PhDs is key to achieving their target of 300 radiographers holding or undertaking a PhD by 2020¹⁰. Furthermore, if the recommendations in the Stern report are taken forward into the next REF, academic radiographers will be expected to be undertaking research at a high level to be submitted for assessment⁵. As radiography is still a young academic profession and there are relatively few radiographers holding PhDs and undertaking research compared to other professions,¹

7,¹⁶ there is a need to develop the academic workforce to a point where research in radiography can not only be supported, but can flourish⁹. However, the evidence in this survey regarding the amount of research time afforded to academic radiographers in the UK suggests that many HEIs are not investing in developing radiography research capacity, with an average of half a day per week being assigned to academic radiographers nationally. Across Europe, only 14.6% of radiography departments responding to a recent survey offer doctoral level study and while similar data is not available for the UK alone, the capacity to develop others to become competent researchers in radiography is likely to be limited and requires improving¹¹. Clearly some radiographers have much more research time allocated, while others have a purely educational and or clinical focus. However, this national picture of a lack of research time and capacity reflects the poor research profile of radiography as a profession at present^{1, 6, 8, 16}, which in turn impacts on the evidence base from which the radiography profession practices. Furthermore, three HEI's reported that radiographers held teaching only contracts, without the requirement to undertake research. While such posts may be appropriate for some individuals and the departments in which they work, such trends if adopted more widely could be damaging to the profession since a lack of development of radiography researchers will reduce the national capacity and the ability for radiographers to influence the evidence base for their own profession.

The academic radiography workforce is small and estimated at less than 2% of the overall therapeutic and diagnostic radiography profession^{12, 13}. However, this small percentage of the workforce carries significant expectations, from educating the radiographers of the future, supporting the development of advanced practice, and supervising doctorate students to become effective researchers and clinicians. However, while acknowledging academic radiographers as the educators of our future workforce and clinical leaders, there are in contrast an extremely small number of radiography Professors in the UK, presenting a lack of opportunity to drive forwards research leadership within the profession¹⁷. The small numbers of radiography Professors may result from the multiple expectations and demands

on radiography academics, who are also required to keep up to date with rapidly changing clinical practice to ensure educational programmes are current and innovative. These requirements are aligned with the wider healthcare academic workforce and similar demands are reported across all professions, along with workloads widely described as unmanageable ¹⁵. Academic posts therefore require enhanced skills sets, including expertise and experience of educational models and practices. This survey identified the transition from a clinical radiographer into an academic radiographer as taking between one and four years. However, if a radiographer enters academia and undertakes a part-time PhD or Professional Doctorate, this will take longer still, with an average of 5-6 years for completion. This could be in addition to the preliminary 1-4 years for transition from clinical to academic radiographer meaning that in real terms it may take 9-10 years to reach Doctorate level. The majority of HEIs offered a mentor for new staff to guide them through their development in academia demonstrating a supportive culture, however mentors without doctoral level qualifications may be limited in terms of the support that they can provide.

Recruitment into academic posts appears buoyant, with on average four applicants who are deemed suitable for each post advertised and with only one post reported as failing to recruit over the previous two years. However, there was a range of minimum qualifications required across the Universities ranging from a BSc or equivalent through to a doctorate depending on the role and grade but MSc or above was seen to be the norm. An increasing number of “frozen posts” were reported, with almost a quarter of HEIs prevented from recruiting to posts when academics left. This is a concerning pattern in a small workforce given the time it takes to develop new academic radiographers, but may be due to current unprecedented uncertainties within radiography education as a result of the Comprehensive Spending Review ^{2, 3}. Succession planning was reported for the majority of leadership roles within academic radiography, but not for lecturer roles. This leaves the academic radiography workforce vulnerable and development opportunities need to be considered for clinical staff wishing to become the academics of the future. There may be limited incentive for

1 radiographers to move from clinical practice to academia; the salary scales for lecturers and
2 senior lecturers span the equivalent NHS agenda for change bands 6-8B^{18 19}. It would seem
3 unlikely that even a highly experienced radiographer moving from clinical practice would
4 meet the academic criteria for the equivalent academic pay scales i.e. senior lecturer and
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6 equally unlikely that a relatively inexperienced radiographer e.g. band 6 would be attractive
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8 as an academic. This is supported by the findings of this study which indicate that Master's
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10 level qualifications are widely expected. This creates the possibility of radiographers either
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12 seeing a reduction in their salaries following a move into academia or being appointed at
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14 senior levels to salary match where they may struggle to perform at the level expected.
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16 Strategically it is therefore recommended that HEI's need to be identifying talented
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18 individuals early in their careers who wish to become academics to ensure they have the
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20 appropriate qualifications, skills and abilities to help drive the profession forwards in the
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22 future. The survey did not explore non-retirement related attrition, but healthcare academics
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24 report unmanageable workloads, a lack of defined time for continuing professional
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26 development and poor work-life balances, which could contribute to further staff losses in
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28 these academic groups ¹⁵.
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36 This study has a number of limitations. While there was a good response rate not all HEI's
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38 in the UK were represented so assumptions have been made based on the data available.
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40 The study did not request staff attrition data for reasons other than expected retirement, so
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42 the turnover of staff is underestimated in this survey. Finally, the overall academic
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44 radiographer qualification profile and research time allocation was not recorded because this
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46 was not the primary focus of the survey and therefore this cannot be reported. However, it is
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48 acknowledged that this information would be useful for future surveys.
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53 In conclusion, whilst the age profile of the academic workforce is well balanced across the
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55 UK as a whole, heavy loss of highly qualified academic radiographers is predicted over the
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57 next 10 years, with newly recruited staff having lower levels of qualifications than those
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59 retiring. As a result, research capacity and educational expertise is likely to be vulnerable
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unless HEI's strategically plan to develop academic radiographers to replace those retiring.

The current unprecedented changes in higher education means that there are many uncertainties for radiography and as a result it is increasingly important that research and educational capacity is maintained and enhanced to ensure there is sufficient provision to support the profession in the future.

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Figure 1: Age profile of diagnostic and therapeutic radiography academics

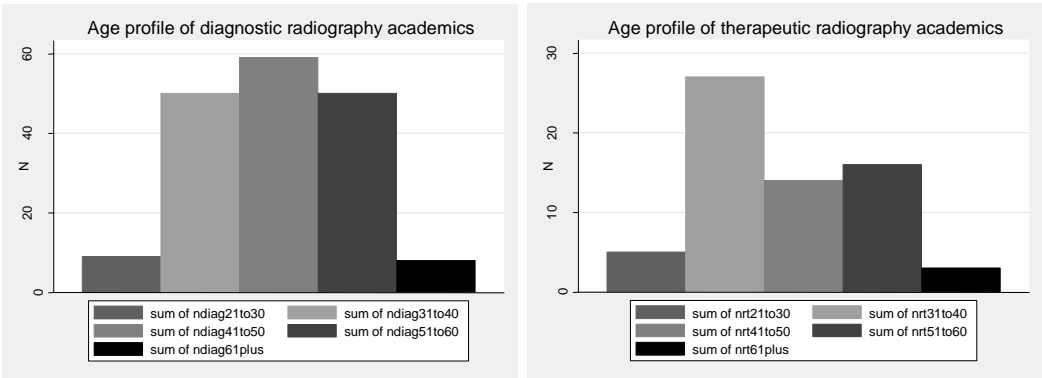


Table 1: Total academic radiography workforce across 18/24 HEI's as indicated by the survey.

	Headcount (N)	Full-time equivalent
Diagnostic Radiography	177	166
Therapeutic Radiography	56	48
Clinical tutors / practice Educators	23	14
Non-radiographers	19	18

Table 2: Retirement profile of the academic radiography and related workforce over the next 10 years.

Academic:	% due to retire in:			
	3 years	5 years	10 years	0 to 10 years
Diagnostic radiographers	9.64	10.73	11.30	31.07
Therapeutic Radiographers	8.93	16.07	8.93	33.93
Clinical Tutors	17.39	8.70	4.35	30.43
Non-radiographers	11.10	5.56	11.1	27.78

Table 3: Qualifications of diagnostic and therapeutic radiographers due to retire in the next 10 years

Highest qualification	N
BSc	3
TDCR	1
PgC	2
PgD	4
MSc	53
PhD / Professional Doctorate	24

Table 4 Previous employment of those entering academia in radiography education

Previous employment area	N UK	N Overseas
Clinical Practice	41	1
Higher Education (Lecturer or above)	5	
Higher Education (internal transfer / temporary contracts)	2	
Other	5	
Failed to recruit	1	

Table 5 outlines the highest qualifications of the radiographers appointed to academic posts in the UK over the previous two years

Highest qualification of appointed radiographers	N Diagnostic	N Therapeutic
BSc / DCR	9	4
PgC	9	
PgD	7	
MSc	21	8
PhD	6	1

Table 6 Minimum Qualifications and clinical experience for radiographers entering academia from the responding HEI's

Lecturer type	BSc / DCR	PgC	N			Median (range)
			PgD	MSc	Doctorate	Clin Exp (yrs)
Associate Lecturer (Teaching only)	12	0	2	1	0	1.5 (0 to 4)
Lecturer (Teaching only)	5	2	1	5	0	1.0 (0 to 5)
Lecturer (Teaching and Research)	2	1	0	11	2	2.0 (0 to 7)
Senior Lecturer (Teaching Only)	2	0	1	11	0	3.5 (0 to 5)
Senior Lecturer (Teaching and Research)	0	1	0	8	7	3.0 (0 to 7)